[0031] FIG. **12** shows a simplified flow chart of a typical node, aggregator, brain interaction, according to certain embodiments.

[0032] FIG. **13** shows a simplified flow chart for automatically generating a floor plan and provisioning a modular accessory, according to certain embodiments.

[0033] FIG. **14** shows aspects of object detection using a configurable home infrastructure, according to certain embodiments.

[0034] FIG. **15** is a simplified graph showing changes is distance measurements between host units as different objects are passed between them, according to certain embodiments.

[0035] FIG. **16** shows aspects of determining a vector for a detected object, according to certain embodiments.

[0036] FIG. **17** is a simplified graph showing aspects of determining a vector for a detected object, according to certain embodiments.

[0037] FIG. **18** shows aspects of differentiating between multiple detected objects in a configurable home infrastructure, according to certain embodiments.

[0038] FIG. **19** is a simplified flow chart showing aspects of object detection, vector detection, and user authentication in a configurable home infrastructure, according to certain embodiments.

[0039] FIG. **20** shows a system configured to perform deductive floor plan generation, according to certain embodiments.

[0040] FIG. **21** shows a number of inputs that can be used by the system for deductive floor plan generation, according to certain embodiments.

[0041] FIG. **22** is a simplified flow chart showing aspects of deductive floor plan generation using a system, according to certain embodiments.

[0042] FIG. **23** is a simplified diagram showing a scene for a system configured to modify media accessories and lighting for a user based on their detected location, according to certain embodiments.

[0043] FIG. **24** is a simplified diagram showing a transition of media and lighting as a user passes from first room to a second room, according to certain embodiments.

[0044] FIG. **25** shows a remote control configured to route control signals to various appliances, media, accessories, and environmental controls, according to certain embodiments.

[0045] FIGS. **26**A-B show a remote control directing media to a number of media accessories based on a directional movement, according to certain embodiments.

[0046] FIG. **27** shows a system for operating a controller device (brain) in a host unit-modular accessory network, according to certain embodiments.

DETAILED DESCRIPTION

[0047] Aspects of the present disclosure relate generally to electrical systems and in particular to a modular and configurable utility infrastructure for a building.

[0048] In the following description, various embodiments of a system for configuring a smart home system will be described. For purposes of explanation, specific configurations and details are set forth in order to provide a thorough understanding of the embodiments. However, it will be apparent to one skilled in the art that certain embodiments may be practiced or implemented without every detail disclosed. Furthermore, well-known features may be omitted or simplified in order to prevent any obfuscation of the novel features described herein.

Simplified Overview

[0049] As a general non-limiting overview, certain embodiments of the present invention can relate to a modular and configurable system for a building (e.g., residential, commercial, or industrial site) that can automatically and dynamically configure a smart building (e.g., smart home) environment as modular accessories are added and removed from the system. One of the core elements of the system include a host unit and modular accessory. The host unit (e.g., see **200** in FIG. **2**A) can be embedded within (or coupled to) a structure of a building such as a wall, floor, or ceiling, and integrated with the electrical infrastructure of the home (e.g., electrical power grid, cable/Ethernet network, etc.). The modular accessory (e.g., see FIGS. **5**A-**5**D) such as a power outlet, light switch, sensor device, etc., can be configured to be interchangeably and non-destructively coupled and decoupled with the host unit. Once coupled, the system can automatically authenticate and configure (sometimes referred to as bootstrapping) the modular accessory by, for example, coupling AC power and/or Ethernet access to the accessory, and configuring the setup and operation of the modular accessory in the smart home environment, which can include setting modular accessory control schemes (e.g., functionality and user control hierarchy) and the like, as further discussed below.

[0050] Continuing the general overview, a network of host units can be configured to communicate with one another using any suitable communication protocol (e.g., ultra-wide band (UWB), radar, ultrasound, RF, etc.) to determine a distance and location of each host unit relative to one another. Some embodiments include hardware elements (e.g., magnetometer, accelerometer, multiple antennas, etc.) to also determine an orientation of each host unit in three-dimensional space. The system can then determine and auto-generate a floor plan for the building based on the determined locations, orientations, and distances without any necessary user input or interaction. This is further discussed below with respect to FIGS. **7**-**9**C. The system may process the distance and/or orientation data at a particular host unit, a central processing device operating as a "brain" (e.g., mobile computing device, desktop computer, etc.), an offsite cloud computing environment, or the like, or any combination thereof, as discussed in further detail below. With the determined floor plan, the system can make intuitive decisions for default auto-configuration of modular accessories.

[0051] For instance, in response to a control switch (e.g., light switch in a modular accessory) being installed in a particular host unit, the system may auto-configure the control switch to control the operation of a particular lighting element in a particular room after determining that the control switch is in the particular room and no other lighting elements or control switches are located in said room. This is but one simple example of the myriad possibilities achievable using aspects of the present invention, and the examples that follow are intended to provide a more thorough understanding of the inventive concepts described herein and should not be interpreted in any way to be limiting in terms of the breadth of application of the present invention. One of ordinary skill in the art with the benefit of this disclosure would understand the many variations, modifications, and